Natural Gas Vehicles

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Alternative Fuel Vehicles or "Clean Fuel Vehicles" Natural Gas Vehicles (NGVs)

- **NGVs – An Overview**
- **NGVs – What are NGVs?**
- **NGVs – Types of NGVs**
- **NGVs – Available NGVs**
- **NGVs – Examples NGVs**
- **NGVs – Infrastructure for NGVs**
- **NGVs – Advantages & Summary**

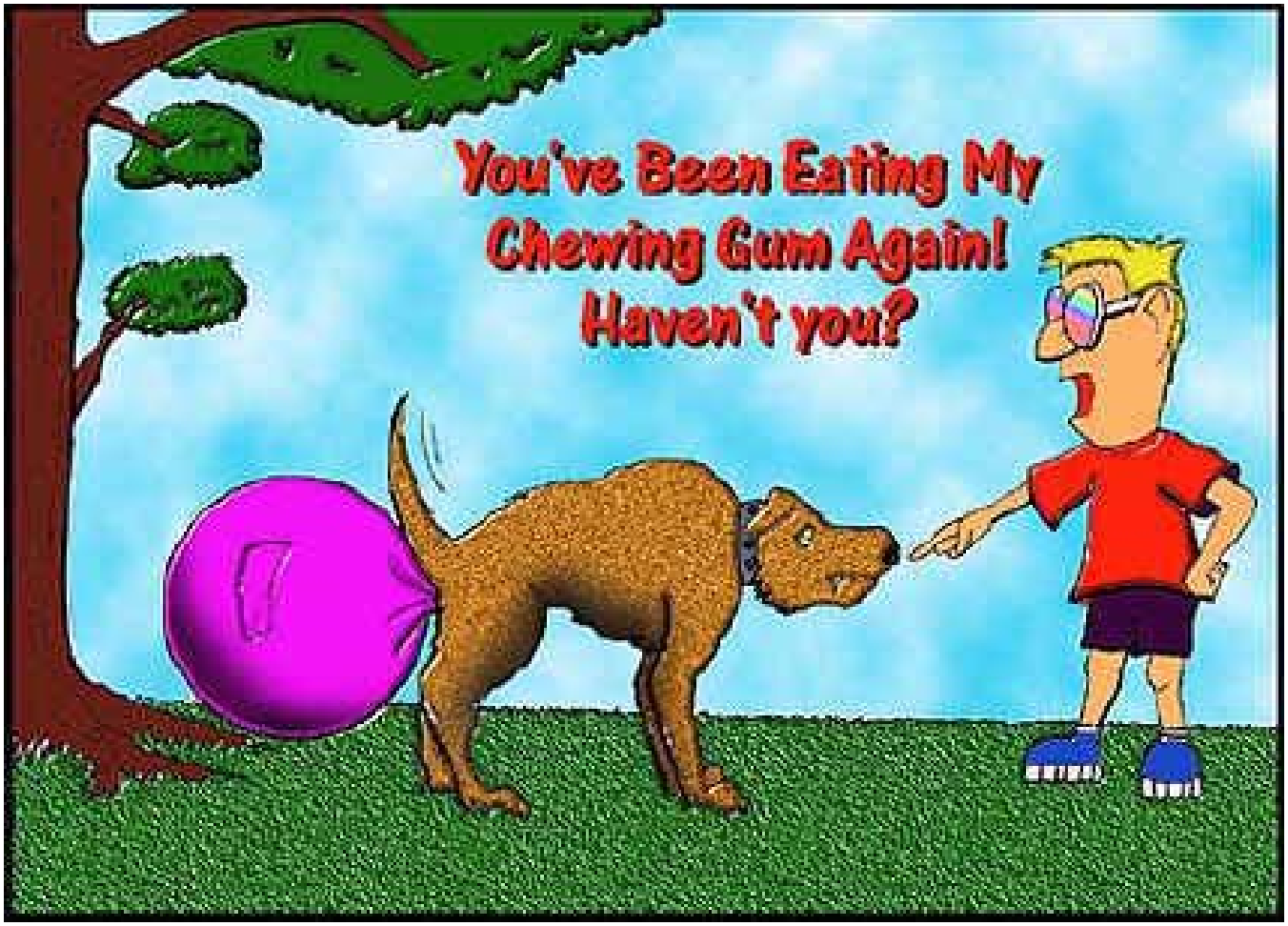
NGVs - Overview

- **Selecting an NGV - Key Questions to Ask:**
  - **What type of vehicles are in your fleet?**
  - **How are your vehicles used? Long or short trips?**
  - **How many miles per day or week do you drive?**

NGVs – Overview (Cont.)

- **Selecting an NGV - Key Questions to Ask:**
  - **Is your driving city or highway?**
  - **Do your vehicles return to a central location at the end of the day?**
  - **Can your vehicles be refueled overnight?**
  - **What are your fuel & maintenance costs?**

Natural Gas



Natural Gas Vehicles (NGVs)

- Natural gas – Is a mixture of hydrocarbons, primarily methane, found naturally in the earth
- Have established distribution infrastructure in many areas
- Have higher costs for vehicle and infrastructure
- Have slow fill and/or fast fill capability
- May be dedicated or bi-fuel

Natural Gas Vehicles (NGVs)

- Are very clean burning
- Have lower fuel costs
- Have excellent safety records (both vehicles and cylinders)
- Have good cold weather starting
- Have abundant domestic and North American supply of natural gas
- Provide longer engine life and lower maintenance costs

Natural Gas Vehicles (NGVs) CNG

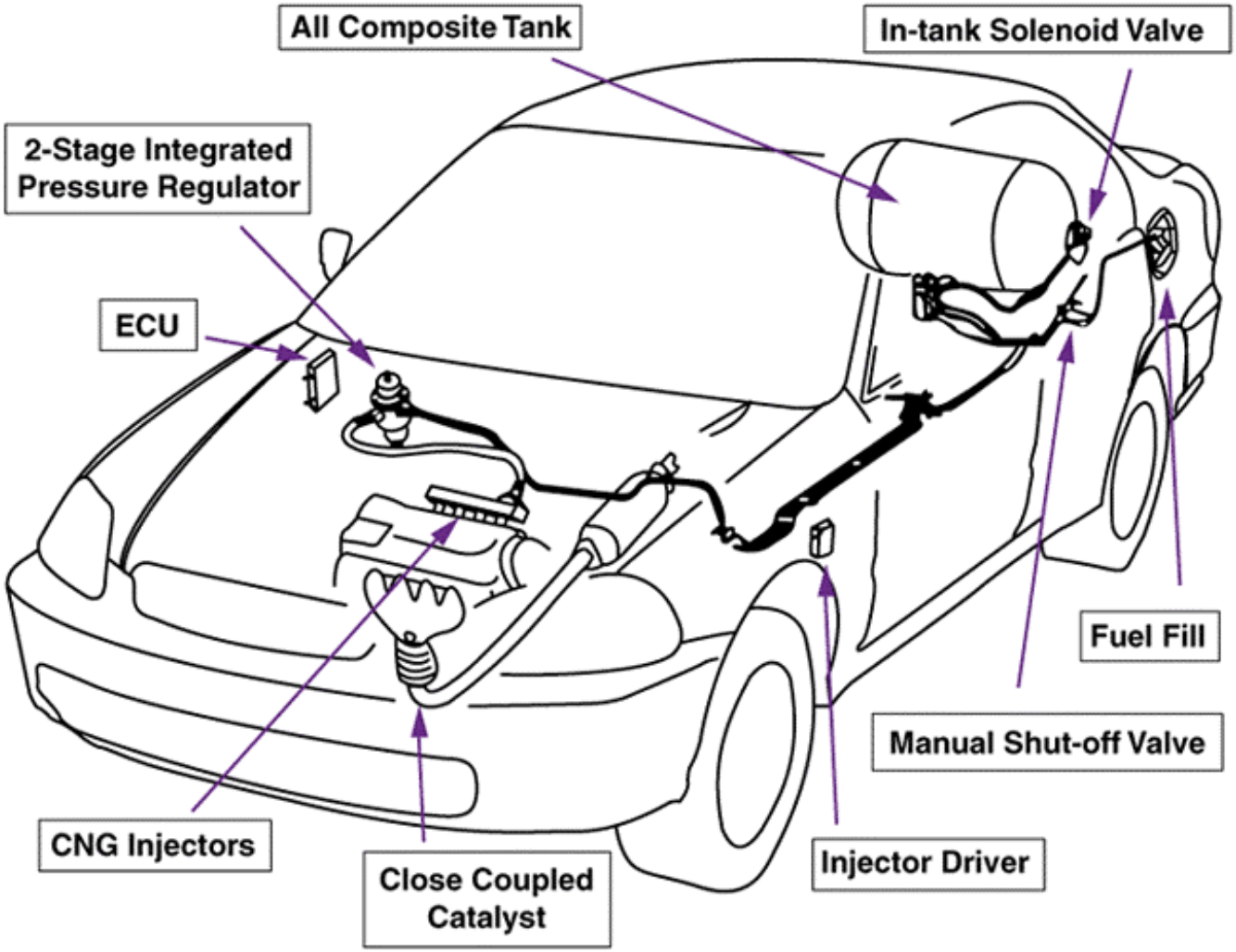
- Compressed Natural Gas (CNG)
  - Natural Gas compressed to 3,000 to 3,600 pounds per square inch (PSI)
  - Placed in specially designed cylinders

Natural Gas Vehicles (NGVs) LNG

- Liquefied Natural Gas (LNG)
  - Is natural gas in liquid form
  - Clear like water
  - Weighs half as much as same volume of water
  - A cryogenic liquid cooled to minus 259° F

Note: LNG will be discussed in Heavy-Duty Session

Natural Gas Vehicle Diagram



Types of NGVs

- **Bi-Fuel**
- **Dedicated**
- **NGV Conversions**
- **Original Equipment Manufacturers (OEMs)**
- **AFV Infrastructure**

Available NGVs

- Bi-Fuel NGVs

Bi-Fuel Conversion

GM Bi-Fuel NGVs

Chevrolet Cavalier

Chevrolet Express

Cargo Van

Available NGVs

- Dedicated NGVs

GM Dedicated NGVs

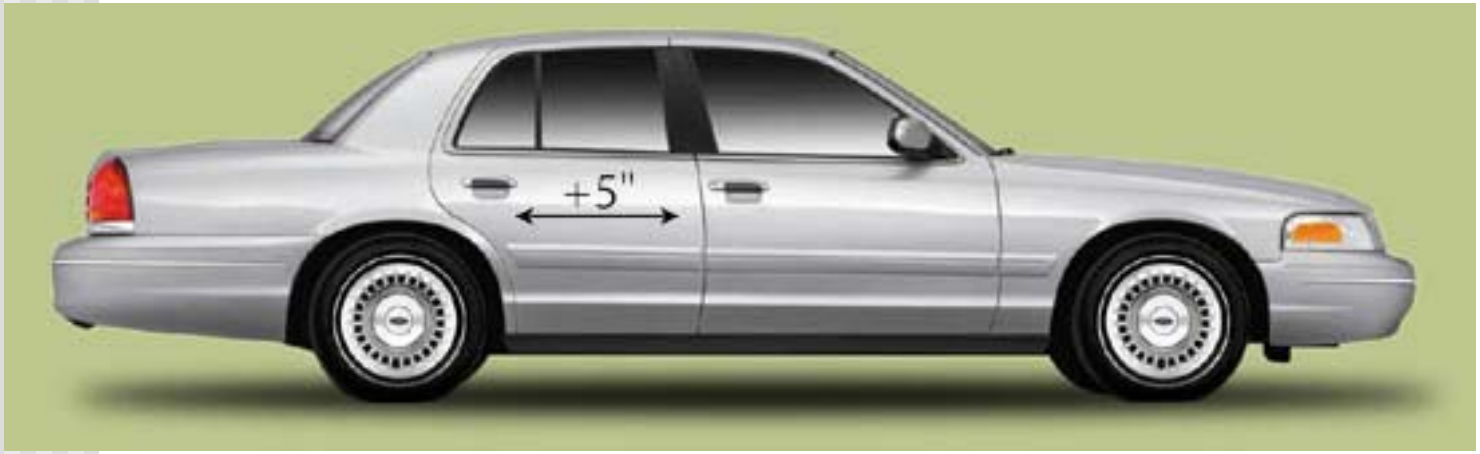
Chevrolet Silverado Pickup

Ford Dedicated and Bi-Fuel NGVs

F-150 Pickup

Ford Dedicated NGVs

Crown Victoria



Ford Dedicated NGVs

E-Series Cutaway

E-Series Wagon/Van

Honda Dedicated NGVs

Civic GX

DaimlerChrysler Dedicated NGVs

Dodge Van/Wagon

NGV Airport Ground Support Equipment

NGV Cylinder Tank

Dedicated NGV School Bus

NGV Shuttle Bus

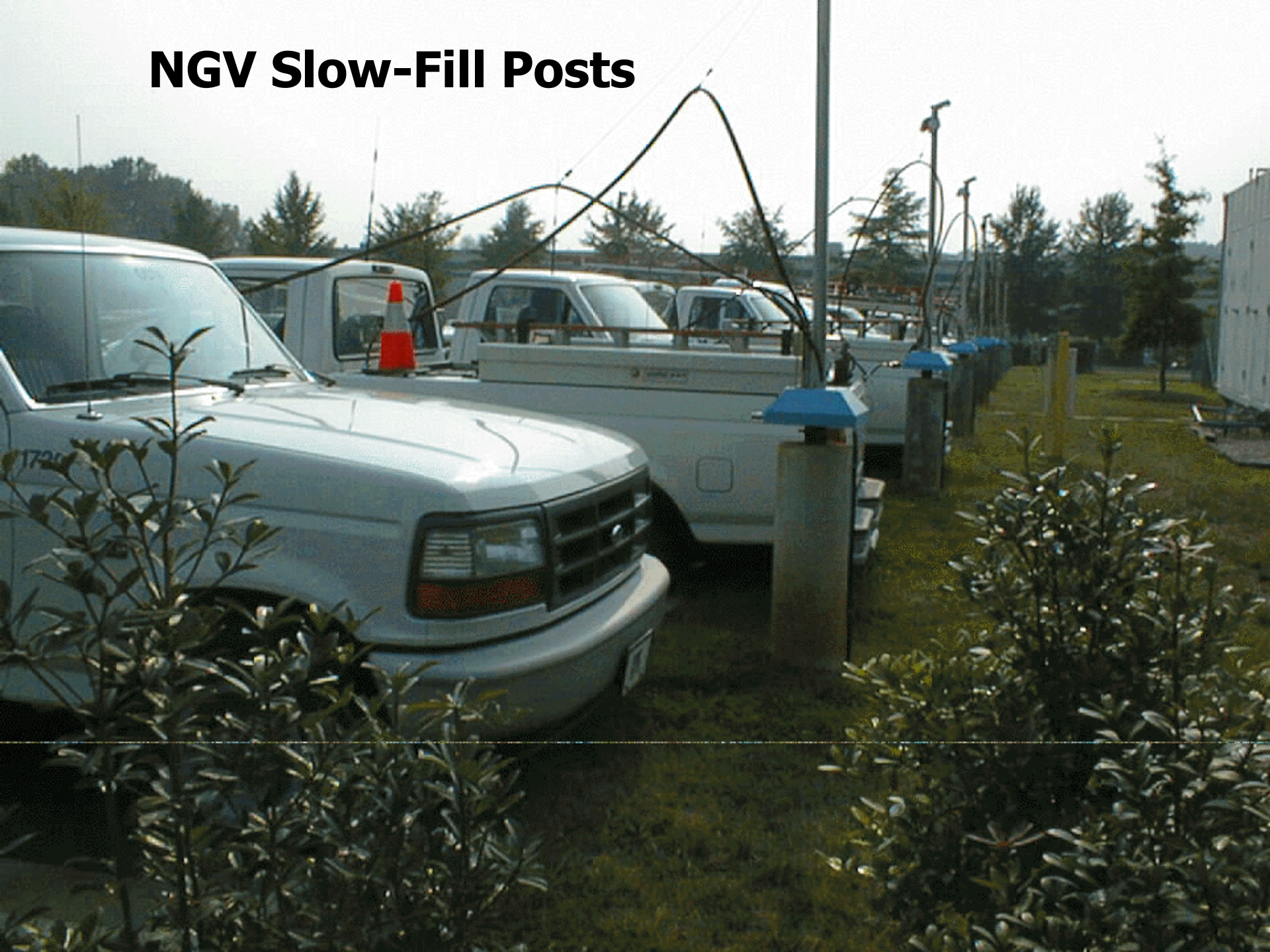
NGVs

- Infrastructure

Large Fast-Fill NGV Station

Medium Sized Fast-Fill NGV Station

NGV Slow-Fill Posts



NGV Small Slow/Fast-Fill Station

Advantages of NGVs

- ☺ **Reduced Exhaust Emissions**
- ☺ **Lower Fuel Costs**
- ☺ **Reduced Maintenance Costs**
- ☺ **Extended Engine Life**

Advantages of NGVs

- ☺ **Very Safe to Operate and Maintain**
- ☺ **Positive Public Perception**
- ☺ **Energy Credits**
- ☺ **Meets Federal Mandates**
- ☺ **Large Domestic Supplies in US**

Natural Gas Contacts

- **Natural Gas Vehicle Coalition**
  http://www.ngvc.org/
- **2000-2001 Natural Gas Vehicle (NGV) Purchasing Guide**
  http://www.ngvc.org/purchasing2000_2001.html#upfit
- **AFDC Alternative Fuels/Natural Gas**
  http://www.afdc.doe.gov/altfuel/natural_gas.html

Natural Gas Contacts

- **Clean Cities AFV Fleet Buyer's Guide**

  http://www.fleets.doe.gov/
- **Clean Cities AFV Listing**

  http://www.ccities.doe.gov/advanced_cgi.shtml
- **Clean Cities/AFDC Refueling Sites Listing**

  http://www.afdc.doe.gov/refueling.html

THANK YOU FOR YOUR ATTENTION!

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